

## Phenolic content and antioxidant activity of *Tetraselmis tetrahele* (West) Butcher 1959 cultured in annular photobioreactor

### ABSTRACT

*Tetraselmis tetrahele* (West) Butcher is an important microalgae due to its high antioxidant content and other bioactive compounds such as flavonoids and polyphenols. Therefore, it has potential as a suitable raw ingredient for various product developments in aquaculture, food and nutraceutical industries. The antioxidant activity of *T. tetrahele* (UPMC-A0007) was determined by culturing in f/2 and Conway media for 56 days in 120 l annular photobioreactors. The total phenolic (TPC) and antioxidant contents of *T. tetrahele* were determined six times during different phases of the culture period. The antioxidant activities of *T. tetrahele*'s crude extract were determined by diphenylpicrylhydrazyl (DPPH), ferric reducing antioxidant power (FRAP) and 2,2'-azino-bis (3-ethylbenzothiazoline-6-sulphonic acid) (ABTS) assays. Two groups of cells based on size; small sized-cells (3.0-5.0 $\times$ 10<sup>11</sup> cell(-1)) and big sized-cells (5.5-8.0 $\times$ 10<sup>11</sup> g cell(-1)) were observed in the f/2 media. Small sized-group showed 1.6 times higher total phenolic content (2.99 $\pm$ 0.14 mg GAEg(-1)) than big sized-cells. These results suggest that *T. tetrahele* is a potential antioxidant source and effective antioxidant production can be achieved by controlling the cell size in their culturing process.

**Keyword:** Antioxidant activity; Cell size; Phenolic compounds; Photobioreactor; *Tetraselmis tetrahele*